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TITLE: Dynamic Gain Equalization MAN/WAN using WDMA
and Semiconductor Optical Amplifi

TBTX:
This document contains drawings, and/or symbols that
will not appear on line. Request from ITIRC for
complete article. - Disclosed is equalization scheme
using planar gratings and semicon ical amplifier
arrays to overcome the near-far nonequal
transmission spectra present in a - A metropolitan
area network or wide area network ) using WDMA has the
potential near-far problem where al signals
originating from different locati nce different
attenuation. Furthermore, fibers amplifiers used in
such a network also have nonflat spectra and thus
different wavelengths experience gain and attenuation
even though they travel through ysical path. Most of
the existing studies on gain equa as been focused on
equalizing the nonflat gain spect optical amplifiers.
Gain equalization using fiber gra ed in the 'Er' sup
3+ fiber amplifier was proposed h a larger
equalization bandwidth is achiev e can not adjust
the gain dynamically. Two-stage f r with offset
gain peaks was proposed in 2] to equalize (by means
of pump power) the optical signal different
channels in a WDMA system. This ver, has a very
limited equalized bandwidth of &a in equalization
can also be achieved through con ransmission
spectra of the optical filters. nciple, an
equalized 29-channel WDM system demonstrated
using a Mach-Zehnder Interferome cousto-optic
tunable filter (AOTF) has also b ualize gain
spectra for a very wide transmis . Through the
injection of multiple RF frequen RF signal
transmitting at a different magn trary
transmission characteristic can . The resolution
of this scheme, however, is lim tion of an an
AOTF. Fig. 1 shows the proposed its of: o
wavelength demultiplexer (e.g., emultiplexes
the incoming multiple optical si dual
wavelength channels, o optical a s, which are
responsible for the gain adjustm al wavelength
channels, o wavelength multiple ) which
multiplexes the gain-equalized to a single
output. - The essence of this c heme relies
on the dynamic adjustment of th cal amplifier
through modifying the injection plifier.

Furthermore, the gain of the opt
adjusted to achieve a constant c
output of the optical amplifier
of the incoming optical power. T
achieved by a close loop monito
2, which o measures the voltage
semiconductor optical amplifier
voltage drop by using a low-pass
resulting value with the desire
used to correct the gain of the
justifiably used because only th
be controlled in the amplifier.
approach is the wide equalizati
grating and semiconductor ampli
high resolution achieved by the
spacing). Furthermore, crosstal
virtually nonexistent in this s
is being amplified. - The poten
consumption required for amplif
necessitate the use of a contro
wavelength multiplexer can be r
optical grating and a planar wa
gratings can be employed but it
improved to be practical. In pa
the planar waveguide grating be
can avoid beam diffraction (2)
semiconductor material which ca
with optical amplifiers. The op
realized with an array of semic
such as wide bandwidth multiple
Similar to the wavelength multi
demultiplexer can be realized w
or waveguide grating. It should
multiplexer, optical amplifier
can be totally integrated by me
semiconductor material. Referen
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